ANNUAL REPORT

OF

THE KEEPER

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE,

TO THE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

FOR

1902-1903.

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UNIVERSITY PRESS: JOHN WILSON AND SON.
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LIBRARY
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CAMBRIDGE, MAS

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1903.

MUSEUM OF COMPARATIVE ZOÖLOGY.

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HENRY P. WALCOTT. GEORGE L. GOODALE.

——— ———, *Curator.* ALEXANDER AGASSIZ, *Secretary.*

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HENRY P. WALCOTT. GEORGE L. GOODALE.

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GEORGE NELSON	*Preparator.*

NATHANIEL S. SHALER	*Professor of Geology.*
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GEORGE H. PARKER	*Assistant Professor of Zoölogy.*
ROBERT DeC. WARD	*Assistant Professor of Climatology.*
WILLIAM E. CASTLE	*Assistant Professor of Zoölogy.*
THOMAS A. JAGGAR, Jr.	*Assistant Professor of Geology.*
JAY B. WOODWORTH	*Assistant Professor of Geology.*

Instructors and Assistants in the Laboratories of Zoölogy and Geology.

PHILIP S. SMITH	*Instructor in Physiography.*
HERBERT W. RAND	*Instructor in Zoölogy.*
GRANT SMITH	*Austin Teaching Fellow in Zoölogy.*
LEON J. COLE	*Austin Teaching Fellow in Zoölogy.*
AUSTIN P. LARRABEE	*Assistant in Zoölogy.*
FREDERICK M. WILDER	*Assistant in Meteorology.*
WALTER S. TOWER	*Assistant in Meteorology.*
JAMES W. GOLDTHWAIT	*Assistant in Geology.*
WILLIAM M. GREGORY	*Austin Teaching Fellow in Geology.*

REPORT.

To the President and Fellows of Harvard College: —

During the past academic year the regular courses in Zoölogy were given in the Museum, this being the first year that this department has enjoyed complete possession of the rooms formerly occupied by the Department of Geology, now finally housed in the new southwest corner-piece, — the Geological Section of the University Museum.

Eleven courses in Zoölogy were given by Professors Mark, Jackson, Parker, Castle, and Dr. Rand, assisted by Messrs. Carpenter, Cushman, Peters, Smith, and three sub-assistants. These courses were attended by two hundred and seventy-one students. Three courses were given to nineteen students of Radcliffe College.

Seventeen courses under the Department of Geology were given by Professors Shaler, Davis, Jackson, Ward, J. B. Woodworth, and Dr. Jaggar, assisted by Messrs. Cushman, Goldthwait, Read, and Wilder. Five hundred and fifty-nine students attended these courses. Five courses were attended by forty-five students of Radcliffe College.

The year has been an eventful one in the number and value of the collections acquired by the Museum. Chief amongst these are the collections of recent and fossil insects of Mr. S. H. Scudder. In transferring his collections to the Museum at this time Mr. Scudder has anticipated a clause in his testament by which these collections are bequeathed to the Museum (see [C], page 34). No gift of such importance and scientific value, representing as it does the life work of one of the foremost students of systematic entomology, has come to the Museum for many years. Mr. Scudder's gift was acknowledged by the Faculty of the Museum at a meeting held July 9.

The large and valuable Bryant collection of birds which has been on deposit in the Museum has been formally and unconditionally presented by Mr. Henry Bryant Bigelow (see [D], page 34). The importance of this acquisition to our ornithological collections is recognized in Mr. Brewster's report.

From Mr. Thomas Barbour we have received an extensive and important collection of alcoholic reptiles and batrachians, the private collection of the donor. This gift is of especial value as it fills many gaps in our series. The Museum is also indebted to Mr. Barbour in many other ways. It is a pleasure to note here the increasing interest taken in the Museum by those students of Harvard University attending courses in the building, as shown by their gifts and additions to its collections.

From the estate of John Bellows, Esq., of Gloucester, England, has been received a series of Devonian and Carboniferous corals bequeathed by him to the Museum. This collection consists of upwards of one hundred and fifty lots of polished sections showing structural details, many of them of extreme beauty.

A valuable series of palæozoic fishes obtained from various sources in Europe by Dr. Eastman has been received from Mr. Agassiz. This accession supplements the extensive collections of fossil fishes in the Museum. For comparison in his studies of the elevated reefs and limestones of the Pacific Islands there has been received through Mr. Agassiz from the Coral-Reef Committee of the Royal Society a series of samples of the core from the deep boring made by Professor David on the atoll of Funafuti (see [E], page 34).

The reports of the different departments show minor gifts and accessions from many sources.

Owing to many petty acts of vandalism perpetrated by the lawless element of the ever-increasing number of public visitors, the Museum Committee has employed a uniformed watchman to patrol the exhibition rooms during the hours when the Museum is open to the public. The salutary effect of this is felt throughout the different sections of the University Museum.

By the appointment of Mr. George Nelson as Preparator, the Museum has realized a great need and secured a competent and zealous helper.

Notable changes have been made in some of the exhibition rooms. The Tertiary, Quaternary, and Jurassic Rooms have been completely cased, heavy plate-glass the full height of the cases being employed, thus avoiding the obtrusive sash bars of the cases in the older exhibition rooms. In two of the rooms plate-glass screens forty feet in length have been constructed, behind which the larger fossil vertebrates are grouped. The exhibits in these rooms are in process of installation. In the hallway of the main entrance on the second floor a large case has been constructed to contain an exhibit of apparatus used in the investigation of the ocean, such as sounding machinery, deep-sea nets and trawls, dredges, etc.

The arrival of a superb specimen of the giraffe from Rowland Ward has necessitated a radical change in the African Room. The three floor cases which contained the larger mammals have been removed, and a single large plate-glass case with a monitor top, eighteen feet in height, erected in its place. The effect is pleasing and dignified, and adds much to the attractiveness of one of the most interesting of the faunal exhibits. It is hoped to install such large central cases in others of the faunal rooms.

The Pacific Room has received many important additions in birds from the Hawaiian and Galapagos Islands, and many minor exhibition specimens have been distributed throughout the Museum, chief amongst which are the mounted turtles and reptiles in the North American Room, the work of Mr. Nelson.

Dr. T. Wayland Vaughan visited the Museum to examine the extensive collections of limestones from the Pacific Islands, brought together by Mr. Agassiz, with a view to preparing a report on the fossil corals. The material selected by him has been forwarded to Washington. Professor C. L. Edwards and his assistant spent several days in Cambridge studying the collections of Holothurioidea. The palæozoic starfishes loaned to Dr. Suchert have all been returned.

The Library report of Mr. Henshaw shows the accessions for the year to be 9,147 volumes, parts of volumes, pamphlets, and maps, nearly doubling in number the accessions registered in the last report. The total number of volumes now in the Museum Library is upwards of 38,000, and of pamphlets upwards of 30,000. This great increment is due in a measure, as Mr. Henshaw points out, to parts of the Hagen and Whitney libraries not hitherto catalogued. In speaking of the Library, I must here again call attention to its increasing demands upon the general funds of the Museum for its maintenance in the interests of the students of the University and Radcliffe College. Library funds are much needed for books, binding, and salaries.

The Museum publications of the year include thirteen numbers of the "Bulletin," with 749 pages and 48 plates, and two numbers of the "Memoirs," with 457 pages and 241 plates, — an increase of 462 pages and 173 plates as compared with the publications of last year. The two "Memoirs" are reports on the Results of Mr. Agassiz's Tropical Pacific Expedition (Nos. IV. and V.). Two numbers of the "Bulletin" are upon geological results of Mr. Agassiz's Fiji Expedition, and one upon his expedition to the Maldive Islands. Volumes XXXIX., XLI., XLII., XLIII., XLV. of the "Bulletin," and XXV., XXVI., XXVII., XXIX., and XXX. of the "Memoirs" are now in course of publication.

A gift of particular interest is an early oil portrait of Professor Louis Agassiz, the founder of the Museum, presented by Captain C. H. Davis, U. S. N. (see [F], page 35). There has been hung in the hall of the main entrance a portrait of Mr. Agassiz by Lefebvre, a bronze tablet under which bears this inscription: — *Alexander Agassiz. This memorial of his great services to Science and the University given by his friends and placed here by special vote of the President and Fellows and Board of Overseers*, — a welcome and fitting gift, a proper tribute. A portrait of the late Sturgis-Hooper Professor of Geology, Josiah Dwight Whitney, by De Camp, has been presented by his family and hangs in the main room of the geological library. The Museum now possesses more than two hundred and fifty framed portraits of distinguished zoölogists and geologists, and many more that have not been hung in the rooms of the library and offices. From Sella and Dr. Fritz Benesch of Vienna has been received an important collection of photographs of the Dolomite region.

W. McM. WOODWORTH,
Keeper of the Museum.

REPORT ON THE ZOÖLOGICAL LABORATORY.

By Professor E. L. Mark.

The courses of instruction were not materially altered from those given in the preceding year, though the laboratory exercises were in some cases considerably changed. The number of students in the several classes from the various departments of the University during the year 1902–03 is shown in the following table, the numbers printed in italics indicating students from the Lawrence Scientific School: —

Courses. 1902–03.	Grad.	Sen.	Jun.	Soph.	Fresh.	Spec.	Bussey.	Total.
Zoölogy 1	2	12 + *2*	20 + *4*	31 + *10*	41 + *12*	5 + *7*	1	112 + *35* = 147
“ 2	2	3 + *1*	3 + *2*	13 + *10*	3 + *2*	1 + *2*		25 + *17* = 42
“ 3	3	3	4 + *6*	3 + *1*		*2*		13 + *9* = 22
“ 4	3	2	1 + *1*			*2*		6 + *3* = 9
“ 5	2	2	1 + *1*			*3*		5 + *4* = 9
“ 9	1	1						2 = 2
“ 9 *a*		1						1 = 1
“ 10	3	1				*1*		4 + *1* = 5
“ 13	5	2	*3*	1		*1*		8 + *4* = 12
“ 16	4	2	*1*	1 + *1*		*1*		7 + *3* = 10
“ 20	8	1 + *1*	*2*					9 + *3* = 12
Sums	33	30 + *4*	29 + *20*	49 + *22*	44 + *14*	6 + *19*	1	192 + *79* = 271

The following table shows in a similar way the number of students of Radcliffe College taking courses in Zoölogy: —

Courses. 1902–03.	Sen.	Jun.	Soph.	Spec.	Total.
Zoölogy 1	2	5	3	2	12
“ 2	2	3			5
“ 3			2		2
Sums	4	8	5	2	19

Aside from ordinary revision, the lectures in Zoölogy 1 were the same as those given in 1901–02; but a change was made in the laboratory exercises by devoting half an hour at the beginning of each three-hour period to a quiz on the subject matter of the exercise and a brief exposition of the work about to be entered upon. Professor Parker had as Chief Assistant in this course in Harvard College Mr. Grant Smith, and as Sub-Assistants, Messrs. A. D. Howard, C. W. Hahn, and A. P. Larrabee. The Assistant in the course to Radcliffe students was Mr. J. A. Long.

In Zoölogy 2, given by Dr. Castle, the third optional hour for lectures was used for about half of the time. Two changes were made in the laboratory work: for the study of the clam was substituted with noticeable advantage that of the squid, and the study of vertebrate anatomy, hitherto pursued on the frog alone, was supplemented by the examination and drawing of typical cross sections of Amblystoma. It is proposed to add next year the same treatment of Amphioxus. A study of the metamorphosis of the frog was omitted this year. A voluntary excursion to the seashore was participated in by about one-third of the class. The Chief Assistant was Mr. A. W. Peters; the Sub-Assistants, Messrs. F. W. Carpenter and A. P. Larrabee.

Dr. Rand largely revised his lectures in Zoölogy 3, but the laboratory work was not much modified from that of the preceding year. With the assistance of the Department Preparator, Mr. M. Reitz, a beginning has been made in preparing skeletons of some of the Vertebrates studied, so that each student may have a set for study without the loss of time involved in making his own preparations. It is proposed to increase this collection till it fully meets the needs of the whole class. The Harvard College Assistant was Mr. F. W. Carpenter; the Radcliffe College Assistant, Mr. J. A. Long.

The laboratory work in Zoölogy 4 was supervised by Dr. Rand, and was as usual on the leech Glossiphonia. There were a few lectures by Dr. Rand on the anatomy and histology of this animal; the remaining lectures were on technique, including bibliographic methods; but owing to want of time methods of reconstruction were omitted.

In Zoölogy 5 the laboratory work was on the development of the chick during the first four days of incubation, and was conducted by Dr. Rand. The lectures, by Professor Mark, covered about the same ground as in previous years.

The number of lectures in Zoölogy 9, given as usual by Professor Jackson, was somewhat increased over that of last year, the optional hour being nearly always made use of.

In Zoölogy 9 *a* the work was chiefly on young stages of living and fossil mollusks.

The lectures in Zoölogy 10 covered the same ground as in 1901–02, when they were last given; especial attention, however, was given by Dr. Castle to questions of sex and its relation to heredity. In the second half-year the influences of chemical and physical agents on protoplasm and its activities were considered. A number of problems connected with heredity, variability, and the influence of environment have been studied by different individuals in this course, and the results of some of these will be published.

Zoölogy 13 was conducted by Professor Parker, and covered the same ground as in 1902–03. It is intended to broaden somewhat the course next year to include sustentative tissues, so that it will be a course in comparative histology, as was originally proposed.

As usual, special topics for investigation were assigned by Professor Parker to the students in Zoölogy 16. The topics were chiefly on sensory organs and their functions. The results of several of these will be published. The lectures were substantially the same as the ones delivered in 1901–02.

The supervision of students engaged in researches (Zoölogy 20) was divided, as proposed in the last report, among the older instructors of the department. Of the twelve students engaged in research, seven worked under the guidance of the Director, two each under Professor Parker and Dr. Castle, and one under Professor Jackson. Additional time for the research work was in a few instances gained by allowing the student to meet the laboratory requirements in some of the formal courses (Courses 10 and 16) by devoting his laboratory time to the topic of his investigation. In all cases satisfactory progress was made with the work, and the results of several of the studies are ready for publication; indeed, two preliminary papers have already been issued as numbers 142 and 144 of the Contributions from the laboratory, — the former embodying some of the results of breeding experiments carried on for some time by Dr. Castle, or under his guidance; the latter some important histological results arrived at under the supervision of Professor Parker.

Owing to delays in the reproduction of plates, the papers by Dr. Hall, Dr. Breed, Mr. Sargent, and Mr. Lander have not appeared, but they are nearly ready for distribution.

In June, 1903, the degree of Doctor of Philosophy was conferred on Amos W. Peters, whose thesis was on "Metabolism and the Reaction of Division in Protozoa." Dr. Peters has been appointed Instructor in Zoölogy at the State University of Illinois.

Professor Parker, besides devoting much time and energy to editorial work, has prepared two papers which have been issued as numbers 138 and 143 of the Contributions. Dr. Castle has published two papers on an important subject, heredity, and has shared in the authorship of a third. These, too, have appeared in the Contributions, being numbers 136, 137, and 142. It is a pleasure to note in this connection the promotion of Dr. Castle to Assistant Professor of Zoölogy.

Dr. C. W. Prentiss, who has held for two years a Parker Fellowship, has been carrying on his studies at the Naples Station and at the University of Strassburg, and has published the following papers: "Ueber die Fibrillengitter in dem Neuropil von Hirudo und Astacus und ihre Beziehung zu den sogennanten Neuronen. Arch. f. mikr. Anat., Bd. 62, pp. 592–606, Taf. 26 Juli, 1903; The Neurofibrillar Structures in the Ganglia of the Leech and Crayfish, with especial reference to the Neurone Theory. Jour. Comp. Neurol., Vol. 13, No. 3, pp. 157–175, pls. 5, 6. October, 1903. He has been appointed to a position in Adelbert College, Western Reserve University, to do the work of the Professor of Zoölogy during a year's leave of absence.

The Virginia Barret Gibbs Scholarship for 1902–03 was held by Mr. Austin P. Larrabee, a graduate of Bowdoin College.

Nine instructors and advanced students carried on work at Wood's Hole during the summer of 1903, eight at the U. S. Fish Commission Laboratory, and one, as holder of a Carnegie Table, at the Marine Biological Laboratory, Wood's Hole. Of these, eight have received aid from the Humboldt Fund aggregating $160.71.

Through the interest and generosity of a few friends of the department, money was secured for the construction of a small number of aquaria, both for salt water and fresh water. These are each five feet long, and are located in the basement room, wholly above ground, under the zoölogical laboratories. The water, fresh as well as salt, is stored in three subterranean cisterns of concrete, holding each about fifteen hundred gallons. From these it is pumped by compressed air into wooden reservoirs, — being at the same time aerated, — whence it is led through wooden pipes to the aquaria. The overflow from the aquaria percolates through sand filters back into the cisterns. The water nowhere comes in contact with metal. The pumping is done by a one-horse-power electric motor. The planning and supervision of construction has taken much of the spare time of the Director, who has had the valuable assistance of Professor Burke of the Engineering Department.

Mr. Samuel H. Scudder has given to the department a considerable number of valuable optical, drawing, and dissecting instruments which have been used by him in his scientific work.

During the latter part of April Professor Mark, in company with Professor Bristol, of the University of New York, made a visit to Bermuda on the invitation of the Bermuda Natural History Society, for the purpose of gaining information as to the desirability of establishing a permanent biological station for research on the islands. The conditions appeared so favorable, and the offers of the Society so generous, that it was decided to raise money for the equipment of a temporary laboratory. An invitation was sent out late in the spring (May) to biologists to avail themselves of the opportunity. The laboratory was opened on the 22d of June, and closed on the 21st of August. There were thirty-four persons enrolled, fourteen of whom were or had been connected with Harvard University or Radcliffe College. The others came from parts of the country as widely separated as New England, Kansas, Minnesota, and Mississippi. Two persons received aid amounting to $57.86 from the income of the Humboldt Fund. Many of the collections were brought to Cambridge, and the results of the investigations will be published in various journals.

The meetings of the Zoölogical Club were held on Monday afternoons throughout the year. The average attendance was between seventeen and eighteen. The papers read and topics discussed were announced in the University Calendar.

Contributions from the Zoölogical Laboratory for the Academic Year 1902–03.

135. Strong, R. M. — The Development of Color in the Definitive Feather. Bull. Mus. Comp. Zoöl., Vol. 40, No. 3, pp. 145–185. 9 pls. October, 1902.
136. Castle, W. E. — Mendel's Law of Heredity. Proc. Amer. Acad. Arts and Sciences, Vol. 38, No. 18, pp. 533–548. January, 1903.
137. Castle, W. E. — The Heredity of Sex. Bull. Mus. Comp. Zoöl., Vol. 40, No. 4, pp. 187–218. January, 1903.
138. Parker, G. H. — The Optic Chiasma in Teleosts and its Bearing on the Asymmetry of the Heterosomata (Flat Fishes). Bull. Mus. Comp. Zoöl., Vol. 40, No. 5, pp. 219–242. 1 pl. January, 1903.
139. Mark, E. L. — A Paraffine Bath heated by Electricity. Amer. Nat., Vol. 37, No. 434, pp. 115–119. 3 figs. February, 1903.
140. Adams, G. P. — On the Negative and Positive Phototropism of the Earthworm Allolobophora fœtida (Sav.) as determined by Light of Different Intensities. Amer. Jour. of Physiol., Vol. 9, No. 1, pp. 26–34. 2 figs. March, 1903.
141. Prentiss, C. W. — Polydactylism in Man and the Domestic Animals, with especial Reference to Digital Variations in Swine. Bull. Mus. Comp. Zoöl., Vol. 40, No. 6, pp. 243–314. 22 pls. and 26 figs. April, 1903.
142. Castle, W. E., and Allen, G. M. — The Heredity of Albinism. Proc. Amer. Acad. Arts and Sciences, Vol. 38, No. 21, pp. 601–622. April, 1903.

REPORT OF THE STURGIS-HOOPER PROFESSOR OF GEOLOGY.

By William M. Davis.

The instruction given by Professor Davis was, as during recent years, a whole course in advanced Physiography and a half-course of intermediate grade. The latter was upon the United States, and in it the laboratory work on charts, maps, and folios was, with the assistance of Mr. Read, developed to a much more satisfactory stage than heretofore. In the advanced course the principal problems discussed were: Piedmont fluviatile plains; the meanders of the Mississippi; the geographic features of extinct glacial lakes; the movement of sands on beaches; the principles of regional physiography, and outlines for practical laboratory exercises. During the autumn and early winter a good share of time was given to the preparation of two reports on the work of the previous summer in Utah, Arizona, Nevada, and Oregon, one of which has been published in the Museum "Bulletin," and the other of which is in press. The former is chiefly concerned with the faults by which the plateaus of southern Utah and northern Arizona are divided. The latter is a discussion of the Basin range problem, to which renewed attention has been recently turned. At the same time supervision was given to the special report on the Hurricane Fault in the Toquerville district of southern Utah by Messrs. Huntington and Goldthwait, who accompanied Professor Davis on his western excursion. A short excursion was made in November to Mt. Mitchell and the Blue Ridge of North Carolina, with special consideration of the Blue Ridge as a retreating escarpment; the results have been published by the Geographical Society of Philadelphia. A certain share of time has been given to the organization of the Harvard Travellers Club, with the object of bringing together Harvard students and graduates, and others interested in the promotion of intelligent travel and exploration. The plan has met with an encouraging response, and the Club seems to be assured of steady growth. It numbers at present about one hundred members.

On April 17 Professor Davis left Cambridge, accompanied by Mr. Ellsworth Huntington as Carnegie research assistant, to proceed *via* Constantinople and Baku to Western Turkestan for the study of geologic and physiographic problems, as members of Professor Raphael Pumpelly's Carnegie expedition to that region. This journey proved most profitable in observations on the elevated shore lines of the Caspian sea, on the great fluviatile plains of Turkestan, and on the terraces and glacial deposits among the western ranges of the Tian Shan system as far as Lake Issikkul. Professor Davis returned *via* Semipalatinsk, Omsk, and St. Petersburg, reaching home August 28. Mr. Huntington remains for the present in Turkestan to continue the investigations begun during the summer. He turned southward from Issikkul late in July, and reached Kashgar near the end of August.

Publications by the Sturgis-Hooper Professor and his Students.

An Excursion to the Plateau Province of Utah and Arizona. Bull. Mus. Comp. Zoöl., XLII. 1903. pp. 1–50. 7 pl.

The Stream Contest along the Blue Ridge. Bull. Geogr. Soc. Phila., III. 1903. pp. 213–244. 4 pl.

The Development of River Meanders. Geol. Mag., Dec. IV. Vol. X. 1903. pp. 145–148.

The Question of Seminars. Harv. Grad. Mag., XI. 1903. pp. 363–370.

By E. Huntington and J. W. Goldthwait.

The Hurricane Fault in Southwestern Utah. Journ. Geol., XI. 1903. pp. 46–63.

By R. M. Brown.

The Mississippi River from Cape Girardeau to the Head of the Passes. Bull. Amer. Geogr. Soc., XXXV. 1903. pp. 8–16.

REPORT OF THE DEPARTMENT OF GEOLOGY AND GEOGRAPHY.

By Assistant Professor Robert DeC. Ward.

The following table gives the number of students who took the various courses in Geology and Geography which were given during the year 1902–03 in the lecture rooms and laboratories of the Museum. The numbers of students of Radcliffe College are in italics.

Two summer courses in Geology and Geography were given. The elementary course in Geology was given by Professor J. E. Woodman, of Dalhousie College, Halifax, N. S., formerly Assistant in Geology in this University. Professor Shaler gave some lectures in this course. The number of students was twenty-one. The summer course in Physiography, attended by forty-one students, was given by Mr. H. T. Burr, assisted by Mr. F. M. Wilder.

Courses.	Students.	
Geology A $^{\text{1 hf}}$	73	*12*
" B $^{\text{2 hf}}$	118	*6*
" 1 $^{\text{1 hf}}$	9	
" 5 $^{\text{2 hf}}$	182	*4*
" 6 $^{\text{2 hf}}$	36	
" 8	27	*2*
" 11	8	
" 14 $^{\text{1 hf}}$	61	
" 15	5	
" 16 $^{\text{1 hf}}$	6	
" 17 $^{\text{2 hf}}$	5	
" 19 $^{\text{1 hf}}$	2	
" 20	4	
" 22	14	
" 23	2	
" 25 $^{\text{2 hf}}$	6	
" 26	1	
" 5*a* $^{\text{1 hf}}$		*25*
Totals 18	559	*49*

The only changes of note in the instruction given during the year 1902–03 as compared with that of the preceding year were the addition of a new whole-course in Palæontology (Geology 11), given by Professor Jackson, which replaces the half-course in Palæontology formerly designated as Geology 14*a*, and the addition of a new research course in Climatology (Geology 26), given by Professor Ward. The following acted as Assistants in the various courses named: Mr. P. S. Smith, Austin Teaching Fellow in Geology, in 4 and 8; Mr. L. LaForge, Austin Teaching Fellow in Geology, in 17 and 22; Mr. M. A.

Read, in 6 and 14; Mr. J. W. Goldthwait, in 4 and 5; Mr. F. M. Wilder, in A and B; and Mr. J. A. Cushman, in 11. In addition, Messrs. I. Bowman, F. F. Burr, F. B. Ely, L. E. Hunt, E. Huntington, L. O. Packard, and W. S. Tower served as student-assistants in the laboratory and field work of Geology 5, under the direction of Professor J. B. Woodworth.

In April, Mr. Read was obliged, by reason of ill health, to resign his position as Instructor in Physiography. Mr. Smith, Austin Teaching Fellow in Geology during the year 1902–03, has been appointed in place of Mr. Read.

After one full year's use of the spacious laboratories and lecture rooms in the new southwest corner-piece of the Museum, the hope of the officers of the department, that their own work and that of their students would, under the new conditions, be done more effectively and more systematically than before, has been fully realized. The statement made in last year's report can but be repeated, with added emphasis, that it is impossible to overestimate the value to the department of the new addition to the Museum. In the course of the year the large model of Boston, deposited in the Museum by the Commonwealth of Massachusetts, was fitted with a plate-glass case, and put on public exhibition, on May 1, in the new Geological Exhibition Rooms, as the nucleus of a geological collection. Other objects secured for the Museum are a valuable collection of relics from the ruined city of St. Pierre, in Martinique, and a large suite of specimens from the Caribbee Islands, collected by Dr. Jaggar. The department has in hand a comprehensive plan for the proposed geological and geographical exhibits.

In November and December, 1902, four illustrated public lectures were given in the new Geological Lecture Room, by Professors Davis, Wolff, and Ward, and Dr. Jaggar, and in July, 1903, during the convention of the National Education Association, the laboratories of Geology, Physiography, and Meteorology were opened to those who wished to inspect the teaching equipment and facilities. Two public lectures were also given at that time, by Professors J. B. Woodworth and Ward.

Professor Shaler gave his courses along the same lines as in previous years. Professor Davis's work is described on an earlier page.

In the Historical Geology (Geology 15) course a few lectures were given by Professor Shaler. The collections used in teaching are in good condition. A number of new diagrams were mounted, and photographic diagrams were added to those already in use for teaching. Dr. Laurence LaForge donated a considerable collection of fossils from the New York State Devonian, especially the Chemung group.

Professor Ward gave his usual courses in Meteorology (Geology B and 1) and Climatology (Geology 19 and 25), and also a new research course in Climatology (Geology 26). A portion of the thesis prepared by Mr. W. S. Tower in the latter course has been published in the "Bulletin of the American Geographical Society" (Vol. XXXV. pp. 253–260). The purchase of thirty sling psychrometers made it possible for the first time to give the class in Elementary Meteorology some actual observational work with these important instruments. The results of this innovation were most satisfactory, and emphasized the need of introducing more instrumental work in this course as soon as possible. Sixteen sets of mounted weather maps of recent date have also added greatly to the interest in the laboratory work in Geology B. Professor Ward was occupied for some months with the proof of his translation of Hann's "Handbuch der Klimatologie," which was published in April, 1903.

Professor J. B. Woodworth reports an increased number of students in courses 5 and 8. There were added by purchase to the equipment of the laboratory in Professor Woodworth's charge during the year a collection of New York State rocks, representing the various horizons of the Palæozoic column there developed; several rocks and minerals to fill gaps in the study series; a set of wall maps of the continents, and, for field work, a small plane table and alidade. Mr. I. Bowman was employed from time to time in labelling the new cases and preparing trays for the reception of the rock collections. Every case in this section of the new building is now in working order, and a catalogue is under way, designed to facilitate reference to any desired object, including the maps and specimens. Mr. Smith during the year completed the numbering and cataloguing of the geological maps in Room 23, and materially advanced the same work upon the rock collections. A few gifts of interest have been received, notably a collection of apparently sand-blasted pebbles from the Keweenaw conglomerate of the Lake Superior District, from Mr. C. H. White.

Professor J. B. Woodworth, under the auspices of the New York State Museum, continued during the year, as time permitted, his investigation of the pleistocene geology of the Hudson and Champlain valleys. He has now in press a paper on the terminal sedentary impressions of the trails known as climactichnites found near West Chazy, N. Y. As a result of last summer's field work a pleistocene map of the Mooer's quadrangle in Clinton County, N. Y., has been nearly completed. Mr. I. Bowman, temporary assistant in the laboratory, left in April in order to take a position on the United States Geological Survey. One full course and two half-courses in Geology in Radcliffe College were conducted as heretofore. One student from the Institute of Technology was given a short course of verbal instruction in glacial geology.

As Chairman of the Committee on the Gardner Collection of Photographs, Professor J. B. Woodworth reports that, to the zeal and efficient help of Mr. Smith, the collection of photographs and slides is at the end of this year for the first time in a satisfactory condition as regards classification of the material, and the registration of the data concerning it. The following statement has been compiled by Mr. Smith for this report: —

State of the Gardner Collection, June 1, 1903.	Photographs.	Lantern Slides.	Negatives.
Accessions since last report	76	325	0
Catalogued since last report . . .	1,450	2,462	0
Unidentified views on hand	253	29	
Duplicates	144	49	
Broken		3	0
Condemned for various reasons . .	23	3	0
Exchanged	0	0	
Last accession number, June 1 . .	5,650	3,836	
Number of views in collection . . .	5,483	3,780	1,064

The large number of views catalogued during the year represents an accumulation of some years concerning which information was not obtained at the time when they were acquired. The larger proportion of slides than photographs acquired during the year expresses the present policy of the department concerning purchases, since it has been found that the slides alone furnish suitable material for illustration before the large classes. The duplicates consist in the main of presentation copies, or of views which have been intentionally duplicated. The negatives belonging to the collection consist very largely of lantern-slide negatives, and most of these are copied from photographs. On April 8 an exhibition of over 150 Norwegian photographs was made before the American Academy of Arts and Sciences in the rooms of the

Museum. The committee is very desirous of securing some means of regularly exhibiting certain parts of the collection to the public. Mr. E. G. Sherwin, Price-Greenleaf aid, acted under Mr. Smith's direction in the care of the lantern slides.

Dr. Jaggar continued his work in charge of the advanced field course in Geology. Fourteen students completed surveys, in the autumn, of the southern part of the Lawrence quadrangle and the eastern part of the Framingham quadrangle. During the second half-year this class investigated the complex problems of the region about High Rock in Melrose, one division of the class completing a large-scale topographic map and inscribing thereon the geology. Mr. LaForge rendered efficient assistance in this work, and completed a thesis on the Geology of Somerville, Mass., which was presented for the degree of Doctor of Philosophy. Special studies of large areas in the vicinity of Boston were made by Messrs. D. C. Bard and F. M. Wilder. Mr. Bard made a reconnaissance geological map of portions of the Lowell and Lawrence quadrangles, and Mr. Wilder, of the Framingham quadrangle. These studies are preparatory to more elaborate work by future classes. In collaboration with Professor Crosby, of the Massachusetts Institute of Technology, arrangements were made with the United States Geological Survey, whereby Dr. Jaggar and Professor Crosby will jointly produce a Boston City folio showing the geology of the Metropolitan district of Boston. Three students from the Institute of Technology joined the Harvard class in experimental geology in the spring, and two of these carried on advanced field work in the Middlesex Fells. In February, Dr. Jaggar gave a course of six lectures at the Lowell Institute on the "Caribbean Volcanic Eruptions and their Bearing on Vulcanology."

Mr. Read gave the course in Elementary Physiography. He also acted as assistant in Geology 6 and 14, and lectured on Elementary Physiography at the Institute of Technology during the first half-year.

The following publications by officers of the department were issued during the year: —

BY R. DE C. WARD.

Translation, with additional notes and references, of Julius Hann's Handbuch der Klimatologie, I. 8vo. pp. xiv, 437. New York and London, The Macmillan Company. 1903.

Relative Humidity of our Houses in Winter. Journ. Geogr., I. 1902. pp. 310–317.

A Year of Weather and Trade in the United States. Pop. Sci. Mo. 1902. pp. 439–448.

Irisirende Wolken. Meteorologische Zeitschrift, XIX. 1902. pp. 437–438.

Current Notes on Meteorology. Science (throughout the year).

Notes on Climatology. Bull. Amer. Geogr. Soc. (throughout the year).

Reviews in Harvard Graduates Magazine, Science, Journal of Geography, and Bulletin of the American Geographical Society.

By J. B. Woodworth.

(Administrative Report on Work in New York.) 20th Report of the New York State Geologist for 1900 (54th Annual Report of the N. Y. State Museum), included in State Geologist's Report. pp. 11–13. Albany, 1902.

The Northumberland Volcanic Plug. 21st Report New York State Geologist for 1901 (55th Annual Report of the N. Y. State Museum). pp. 17–24. With, Petrography and Age of the Northumberland Rock, by H. P. Cushing. pp. 24–29. Albany, 1903.

(Notice of) Washington Geological Survey. Annual Report for 1901. Amer. Geol., XXX. 1902. p. 330.

By T. A. Jaggar.

The Crater of the Soufriere Volcano, St. Vincent. Harper's Weekly, Sept. 13, 1902.

Mt. Pelée's Renewed Activity. Boston Transcript, Sept. 3, 1902.

The Next Eruption of Pelée. Science, n. s., XVI., No. 413, Nov. 28, 1902.

Professor Heilprin on Mt. Pelée. Science, n. s., XVII., No. 428, March 13, 1903.

Reviews in Science.

By J. A Cushman.

Studies of Localized Stages of Growth in some Common New England Plants. Amer. Nat., XXXVI. pp. 865–885.

Studies of Localized Stages in some Plants of the Botanic Gardens of Harvard University. *Ibid.*, XXXVII. pp. 243–259.

REPORT ON THE MAMMALS.

By Outram Bangs.

The additions to the mammal collections during the year by gift, exchange, and purchase are as follows: —

Five hundred and fifty-five skulls and three hundred and five skins, many with skulls, collected in Labrador by Mr. J. D. Sornborger; purchased. One hundred and seven skins and skulls collected in Honduras by Mr. W. W. Brown, Jr., and presented by Messrs. E. A. and O. Bangs. A mounted skeleton of *Ornithorhynchus anatinus;* purchased from Roland Ward. A mounted specimen of *Giraffa camelopardis* collected in East Africa by Mr. P. H. G. Powell Cotton; purchased from Roland Ward. Other acquisitions make a total of one thousand and twenty-four specimens.

The Museum is indebted for gifts to Messrs. J. H. Blake, E. A. and O. Bangs, W. E. Castle, H. B. Bigelow, G. Nelson, C. S. Brimley, and T. Barbour.

Material has been lent to Messrs. A. H. Howell, F. M. Chapman, C. Hart Merriam, D. G. Elliot, J. A. Allen, and Vernon Bailey.

The Museum collections of alcoholic bats have been returned by the Marquis Doria of Genoa, to whom they were loaned for study some years ago.

I have published during the year: —

In the Auk: —

A New Long-billed Marsh Wren from Eastern North America. Vol. XIX. pp. 349–353. 1902.

The Occurrence of Boobies in Numbers on the East Coast of Florida during a Storm. Vol. XIX. pp. 395–396. 1902.

In the Bulletin of the Museum: —

Birds and Mammals from Honduras. Vol. XXXIX. No. 6. pp. 141–159. 1903.

In the Proceedings of the Biological Society of Washington: —

Description of a New Neotoma from Mexico. Vol. XVI. pp. 89–90. 1903.

The Proper Name of the Redwood Chickaree. Vol. XVI. pp. 99–100. 1903.

In the Proceedings of the New England Zoölogical Club: —

Description of a New Thrush from Chiriqui. Vol. III. pp. 91–92. 1902.

Stejneger's Catalogue of Birds thus far Recorded from the Liu Kiu Islands, Japan. Revised with Additions to Date. Vol. III. pp. 93–97. 1903.

Description of a New Race of the Great Blue Heron from the Galapagos Islands. Vol. III. pp. 99–100. 1903.

On a Specimen of *Galictis canaster* Nelson. Vol. III. pp. 101–102. 1903.

A New Race of *Seotothorus verœpacis* from Chiriqui. Vol. III. pp. 103–104. 1903.

Description of a New Subspecies of *Manacus candei* (Parzud.). Vol. III. pp. 105–106. 1903.

A New Race of the Carolina Chickadee from Southern Florida. Vol. IV. pp. 1–2. 1903.

A New Wren from San Miguel Island, Bay of Panama. Vol. IV. pp. 3–4. 1903.

The Louisiana Cardinal. Vol. IV. pp. 5–7. 1903.

A New Race of *Vireosylva josephœ* from Chiriqui. Vol. IV. pp. 9–10. 1903.

REPORT ON THE BIRDS.

By William Brewster.

In my report for 1899–1900 I mentioned that the Museum had received that year "from the Bigelow family of Boston, through Mr. Henry Bryant Bigelow, . . . nominally on deposit, but with the assurance that they are not likely to be removed from their present quarters," a large number of skins of North American and West Indian birds. All of these have now been formally presented to the Museum by Mr. Bigelow (see [D], page 34).

This collection forms, without question, not only the largest but decidedly the most valuable acquisition which our bird department has received by gift since I have been connected with it. There are, as I stated in the report for 1899–1900, "upwards of eight thousand skins of North American and West Indian birds. Of these about six hundred — the original nucleus of the collection — are of especial interest and value from the fact that they were collected and prepared by the late Dr. Henry Bryant, the others having been obtained later by Dr. William S. Bryant and his nephew, Mr. Bigelow." Most of the specimens are in excellent condition, and the greater part of them have been relabelled under Mr. Bigelow's direction and at his expense. Nothing remains to be done to them, therefore, but to weed out such as are obviously duplicates (the number of these is not likely to be large, for very fortunately the collection, as a whole, supplements rather than duplicates that already in the Museum) and to enter the remaining birds in our catalogue.

The Museum is still further indebted to Mr. Bigelow for a collection of birds made by him in Ceylon as well as for those of one hundred and ninety-nine North American birds.

The Museum has also received by gift: From G. Nelson, six mounted specimens of North American birds; from T. Barbour, an albinistic specimen (mounted) of the Florida Grackle (*Quiscalus q. aglœus*); from Willis H. Chandler, a mounted parrot (*Psittacus* *erythacus*); from A. H. Clark, a nest (described in the Auk, XIX., 1902, 266) of Lawrence's Gnatcatcher (*Polioptila plumbiceps*), obtained by him at Margarita Island.

The following birds have been acquired by purchase: From C. K. Worthen, thirty-five skins obtained in the Galapagos Islands by R. H. Beck; from A. Girtaner, a mounted Penguin (*Pheniscus magellanicus*).

Since the publication of the last report fifty-seven birds have been mounted and placed on exhibition. Of these twenty-four are from the Galapagos Islands, an equal number from the Hawaiian Islands, and five from Massachusetts.

I have published during the year:—

In the Auk:—

Unsatisfactory Records. (Wm. Brewster and Ralph Hoffmann.)
Breeding Grounds of the Black and Socorro Petrels. A Correction.
Obituary notice of Dr. James Cushing Merrill.

In the Bulletin of the Museum of Comparative Zoölogy:—

Birds of the Cape Region of Lower California.

REPORT ON THE REPTILES, BATRACHIANS, AND FISHES.

By Samuel Garman.

In these departments the largest addition was a collection of more than two hundred species of reptiles and batrachians donated by Mr. Thomas Barbour. The collection was in good condition, with comparatively few duplicates, and, being gathered from widely separated localities, it supplied many of our desiderata. Through Mr. Barbour's interest, other representatives of good species were received from the New York Zoölogical Park. Some of these were especially desired for the exhibition rooms, for which, with others, they have been well prepared by Mr. Nelson. A large collection of Japanese fishes has been received from Stanford University through Professors Jordan and Snyder, and another extensive series of Hawaiian species was obtained from the United States Commission of Fish and Fisheries. The list of donors includes the names of Alexander Agassiz, Outram Bangs, Thomas Barbour, Austin C. Clark, Prof. Hubert Lyman Clark, E. N. Carter, Walter Deane, R. H. Howe, Jr., D. S. Jordan, George Nelson, the New York Zoölogical Society, G. H. Parker, J. O. Snyder, the U. S. Fish Commission, and B. G. Wilder. Specimens in exchange or for study were sent E. H. Baynes and the New York Zoölogical Park. The alcoholic portions of the storage collections have been worked over, with the result that the jars are cleaned, waxed, and filled, and otherwise put in good condition. Various additions, including mounted specimens, have been made to the exhibition series. More than the ordinary use of the collections has been made by students.

REPORT ON THE ENTOMOLOGICAL DEPARTMENT.

By Samuel Henshaw.

In the Report for 1901–02, p. 25, the accession of Mr. S. H. Scudder's collection of the early stages of Rhopalocera was acknowledged. During the present year Mr. Scudder has anticipated his testamentary act and passed to the Museum his collections of fossil and recent insects (see [C], page 34). It is difficult to overstate the value of this donation, containing as it does a very large proportion of the types described by Mr. Scudder in his numerous contributions to systematic entomology.

Additions to the collections of the department, for which thanks are due, have been received from Mrs. R. A. Hart, Mrs. H. E. Scudder, Miss E. B. Bryant, Miss H. S. Clark, Miss F. W. Smith, Miss G. A. Thurston, and Messrs. W. P. Alcott, G. M. Allen, Outram Bangs, Thomas Barbour, W. W. Barbour, J. H. Blake, Frederick Blanchard, William Brewster, Laurence Brooks, W. N. Bullard, August Busck, W. E. Castle, A. H. Clark, T. D. A. Cockerell, W. M. Courtis, Walter Deane, C. R. Eastman, J. H. Emerton, H. C. Fall, W. G. Farlow, W. L. W. Field, S. L. Fridenberg, Samuel Garman, C. W. Hahn, Roland Hayward, J. G. Jack, O. A. Johannsen, C. W. Johnson, E. L. Mark, A. L. Melander, A. P. Morse, C. J. Murray, J. G. Needham, H. L. Newcomb, J. T. Nichols, Wirt Robinson, E. A. Schwarz, E. J. Smith, J. B. Smith, J. D. Sornborger, J. E. Talmage, Roland Thaxter, A. H. Thayer, A. E. Verrill, C. P. Whitney, and E. B. Williamson.

By purchase there have been added small series of Lepidoptera and Coleoptera from Africa, of Lepidoptera from Florida and the Bahamas, and of Odonata from Central America.

A large part of the Scudder collection of the early stages of Rhopalocera and of the Thaxter collection of Heterocera have been incorporated with the regular series. A part of the Lycænidæ and of the Pieriinæ of the Rhopalocera, some of the Tineid groups and the Lipariidæ and the Notodontidæ of the Heterocera have been revised. Two cases and two hundred boxes have been received and utilized. The Myriopoda loaned Dr. Fr. Meinert for study twenty years ago have been returned, but without the critical determination hoped for.

REPORT ON THE CRUSTACEA AND MOLLUSCA.

By Walter Faxon.

With the help of Miss E. B. Bryant, I have overhauled the whole of the alcoholic mollusks stored in the basement of the Museum. Block tin numbers have been placed in each jar, corresponding to the numbers in a new catalogue prepared by Miss Bryant. Certain of the dry collections of especial value by virtue of the work expended on them by specialists, and of the number of types they comprise, have also been catalogued by Miss Bryant under my supervision. Among these are the Godman collection of Central-American land-shells, forming part of the material worked up by Von Martens for the Biologia Centrali-Americana, Henry Suter's New Zealand shells, and the Blake Expedition Mollusks collected in 1877–80, and identified by W. H. Dall and K. J. Bush. I am convinced that only in this way can large collections of type material be made permanently safe and at the same time easily available.

During the year Miss M. J. Rathbun has published in the Museum "Bulletin" (Vol. XXXIX., No. 5) an account of the Crustacea collected by Mr. Agassiz in the Maldive Archipelago in 1901–02. Her report comprises description of six new species, the types of which are now in our Museum.

The Assistant would here acknowledge with thanks the gifts to the collections received from Messrs. A. Agassiz, T. Barbour, J. H. Blake, Owen Bryant, A. S. Pearse, J. H. Sears, R. K. Smith, and E. B. Wilson. Exchanges of specimens have been negotiated with the United States National Museum, and loan of material to the United States National Museum and to Mr. T. Thompson of Clark University.

REPORT ON THE DEPARTMENT OF VERTEBRATE PALÆONTOLOGY.

By Charles R. Eastman.

Since the date of the last Report, the Assistant has spent several months in Europe studying the palæontological collections of the principal museums, and making extensive purchases of fossil vertebrates, in particular Palæozoic and Eocene fishes, for this department. The Eocene material includes an especially fine suite of specimens from Monte Bolca, Italy, brought together by the Marchese di Canossa of Verona, and first offered to this Museum for sale in its entirety. Our representation of fossil fishes from the Old Red Sandstone of Scotland, and from the Devonian of other countries, has also been considerably augmented. All of the material mentioned in the last Report as having been borrowed for study has been returned to the Museum in good condition.

Additions to the Collection during the Year.

1902. Teeth, vertebræ, calcified cartilage and shagreen of a single individual of Corax from the Niobrara Cretaceous of Kansas. Purchased of C. H. Sternberg. Received August 3.

1902. Cast of the symphysial dentition of *Helicoprion bessonowi* Karp., from the Lower Permian of Russia. Presented by Dr. A. Karpinsky. Received August 6.

1903. A varied assortment of fossil fishes from the Lower Devonian of Scotland and from the Lias of England. Purchased of R. Damon, Weymouth, England. Received January 12.

1903. Fossil fishes from various European horizons and localities. Purchased of Dr. F. Krantz, Bonn, Germany. Received March.

1903. Canossa Collection. An interesting series of Eocene fishes and type specimens of Archiophis from Monte Bolca, near Verona, Italy, collected by the Marchese, Ottavia di Canossa. Purchased. Received March.

1903. Elephant tooth from Cosala, near Durango, Mexico. Presented by Mr. Gilbert Gurney. Received May 4.

Papers published during the Year.

Textbook of Palæontology [translated and edited from the German of Karl A. von Zittel]. Vol. II. pp. 284. Macmillan & Co.

Synopsis of the Missourian and Permo-Carboniferous Fish-fauna of Kansas and Nebraska. [With E. H. Barbour.] Science, n. s., Vol. XVI. pp. 266, 267.

Phylogeny of the Cestraciont Group of Sharks. *Ibid.*, p. 267.

The Carboniferous Fish-Fauna of Mazon Creek, Illinois. Journ. Geol., Vol. X. pp. 535–541.

Some hitherto unpublished Observations of Orestes St. John on Palæozoic Fishes. Amer. Nat., Vol. XXXVI. pp. 653–659.

On the Genus Peripristis, St. John. Geol. Mag. [4], Vol. IX. pp. 388–391.

Sharks' Teeth and Cetacean Bones from the Red Clay of the tropical Pacific. Mem. Mus. Comp. Zoöl., Vol. XXVI. pp. 179–191.

Carboniferous Fishes from the Central Western States. Bull. Mus. Comp. Zoöl., Vol. XLII. pp. 163–226.

Princeton Patagonian Reports: Hatcher's Narrative [Review], Jour. Geol., Vol. XI. pp. 428, 429.

REPORT ON THE LIBRARY.

By Samuel Henshaw.

During the year from August 1, 1902, to July 31, 1903, 3,624 volumes, 1,827 parts of volumes, 3,529 pamphlets, and 167 maps have been added to the Library.

The total number of volumes in the Library is 38,082, the total number of pamphlets 31,723.

The additions include a part of the Whitney and Hagen libraries not previously enumerated, together with a number of volumes and parts obtained by exchange or purchase to fill lacunæ in serials.

Seven hundred and sixty-one volumes have been bound; eleven hundred pamphlets have been separately bound.

[A]

PUBLICATIONS

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

FOR THE ACADEMIC YEAR 1902–1903.

Bulletin: —

- Vol. XXXVIII. Geological Series, Vol. V.
  - No. 7. River Terraces in New England. By W. M. Davis. pp. 68. October, 1902.
  - No. 8. The Foraminifera and other Organisms in the Raised Reefs of Fiji. By R. L. Sherlock. pp. 19. March, 1903.
- Vol. XXXIX.
  - No. 4. Illustrations of Odonata: Argia. By Hermann A. Hagen. With a List and Bibliography of the Species. By Philip P. Calvert. pp. 20. 2 Plates. November, 1902.
  - No. 5. Crabs from the Maldive Islands. By Mary J. Rathbun. pp. 18. 1 Plate. December, 1902.
  - No. 6. Birds and Mammals from Hondurus. By Outram Bangs. pp. 21. July, 1903.
  - No. 7. Carboniferous Fishes from the Central Western States. By C. R. Eastman. pp. 66. 5 Plates. July, 1903.
- Vol. XL.
  - No. 3. Contributions from the Zoölogical Laboratory. No. 135. The Development of the Definitive Feather. By R. M. Strong. pp. 41. 9 Plates. October, 1902.
  - No. 4. Contributions from the Zoölogical Laboratory. No. 137. The Heredity of Sex. By W. E. Castle. pp. 32. January, 1903.
  - No. 5. Contributions from the Zoölogical Laboratory. No. 138. The Optic Chiasma in Teleosts and its bearing on the Asymmetry of the Heterosanata (Flatfishes). By G. H. Parker. pp. 24. 1 Plate. January, 1903.
  - No. 6. Contributions from the Zoölogical Laboratory. No. 141. Polydactylism in Man and the Domestic Animals, with especial Reference to Digital Variations in Swine. By C. W. Prentiss. pp. 72. 22 Plates. April, 1903.
- Vol. XLI.
  - No. 1. Birds of the Cape Region of Lower California. By William Brewster. pp. 242. 1 map. September, 1902.
- Vol. XLII. Geological Series, Vol. VI.
  - No. 1. An Excursion to the Plateau Province of Utah and Arizona. By W. M. Davis. pp. 50. 7 Plates. June, 1903.

No. 2. The Chemical Composition of Limestones from upraised Coral Islands, with Notes on their Microscopical Structures. By ERNEST W. SKEATS. pp. 76. June, 1903.

Memoirs: —

Vol. XXVI.

No. 4. Reports on the Scientific Results of the Expedition to the Tropical Pacific, 1899–1900. V. Sharks' Teeth and Cetacean Bones. By C. R. EASTMAN. pp. 14. 3 Plates. June, 1903.

Vol. XXVIII.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, 1899–1900. IV. The Coral Reefs of the Tropical Pacific. By ALEXANDER AGASSIZ. 33,410 pp. 238 Plates. February, 1903.

Report: —

1901–1902. 32 pp. 2 Plates. December, 1903.

[B]

INVESTED FUNDS OF THE MUSEUM.

IN THE HANDS OF THE TREASURER OF HARVARD COLLEGE, SEPT. 1, 1901.

Sturgis-Hooper Fund	$100,000.00
Gray Fund	50,000.00
Agassiz Memorial Fund	297,933.10
Teachers and Pupils Fund	7,594.01
Permanent Fund	117,469.34
Humboldt Fund	7,740.66
Virginia Barret Gibbs Fund	5,000.00
Willard Peele Hunnewell Memorial Fund	5,000.00
	$590,737.11

The payments on account of the Museum are made by the Bursar of Harvard College, on vouchers approved by the Keeper. The accounts are annually examined by a committee of the Overseers. The only funds the income of which is restricted, the Gray and the Humboldt Funds, are annually charged in an analysis of the accounts, with vouchers to the payment of which the income is applicable.

The income of the Gray Fund can be applied to the purchase and maintenance of collections, but not for salaries.

The income of the Virginia Barret Gibbs Scholarship Fund, of the value of $250, is assigned annually with the approval of the Faculty of the Museum, on the recommendation of the Professor of Zoölogy and of Comparative Anatomy in Harvard University, "in supporting or assisting to support one or more students who have shown decided talents in Zoölogy, and preferably in the direction of Marine Zoölogy."

The income of the Humboldt Fund (about $300) can be applied for the benefit of one or more students of Natural History, either at the Museum, the United States Fish Commission Station at Wood's Hole, Bermuda, or the Tortugas.

Applications for the tables reserved for advanced students at the Wood's Hole Station should be made to the Faculty of the Museum before the 1st of May. Applicants should state their qualifications, and indicate the course of study they intend to pursue.

[C]

CAMBRIDGE, Jan. 5, 1903.

DEAR MR. HENSHAW, — Enclosed please find a copy of that portion of my will which relates to my natural history collections.

As I cannot use them any more nor take that care of them which such objects demand, I hereby offer them at once to the Museum of Comparative Zoölogy on the terms set forth in the enclosed section of my will.

Yours very truly,
SAMUEL H. SCUDDER.

ARTICLE 6.

Will of Samuel H. Scudder. Dated Feb. 23, 1897.

6. I give my natural history collections of whatever nature, and my cabinets to the Museum of Comparative Zoölogy in said Cambridge, on condition that, within six months after receiving the same, the said Museum of Comparative Zoölogy shall give to the said Boston Society of Natural History such New England specimens of Orthoptera and Lepidoptera mounted on pins or in bottles, excepting types, as the said Boston Society of Natural History may select; and on the further condition that, after the said Museum of Comparative Zoölogy shall have selected from the series of fossil insects one specimen of each species (as arranged by me) the said Museum shall give to the United States National Museum at Washington in the District of Columbia, the privilege of selecting for its own use, a second specimen of each species, when there is in my collection such a second specimen.

[D]

CAMBRIDGE, June 3, 1903.

DEAR MR. BREWSTER, — I saw Dr. Woodworth a few days ago, and turned over to him for the Museum the Bryant collection of birds, which has been here on deposit for the last few years. The gift of the collection to the Museum is unconditional and absolute, and the conditions of deposit, stated in our last letters on the subject, are therefore no longer in force. With the skins are of course included all the tin cases in which they are contained.

Yours very truly,
HENRY B. BIGELOW,
W. S. BRYANT, by H. B. B.

[E]

ROYAL COLLEGE OF SCIENCE, LONDON,
SOUTH KENSINGTON, S. W., 7th April, 1903.

MY DEAR PROFESSOR AGASSIZ, — I hope that you had a very pleasant voyage back to the States.

I have just sent off to you at the Museum the set of samples of Funafuti slices, which I hope will reach you safely. I had to submit them to the Royal Society Coral-Reef Committee, and they at once agreed to my sending them on the understanding that they are used as mineral specimens, and any criticism on the organisms should be based on the complete core at Sydney or on the core and sections to be deposited in the British Museum. Of course from what you kindly told me when you saw the specimens I was able to give this assurance, and I trust that they will prove useful for comparison with your upraised reefs.

Believe me to remain, very truly yours,
John W. Judd.

[F]

U. S. Naval Observatory, Georgetown Heights,
Washington, D. C., October 6, 1902.

My dear Sir, — You may possibly recall a conversation which we had at a dinner given to the National Academy of Sciences, I think on the event of your inauguration as President. This conversation related to a portrait of your father, which is in my possession, and which I then expressed a desire to present to the Museum of which he was the illustrious founder.

As I am about to break up at the Observatory, I am now ready to deliver the picture, and will send it boxed to the address as given by you on notification from you that it will be agreeable to you to receive it. The picture was, to the best of my belief, painted by Ames, of Boston, and represents Professor Agassiz at just about the time when the first building of the Museum was under construction on Divinity Avenue. It would therefore be particularly appropriate for the Museum.

The only conditions which I attach to this gift are that it shall be considered as a donation to the Museum and not to an individual; 2d, that it shall be held in perpetuity and constantly exhibited in the Museum ; 3d, that the Museum shall agree that it will at no time dispose of this picture, either by sale or gift; 4th, that if at any time it should decide or desire so to dispose of the picture, that it shall then revert to the heirs or assigns of the donor.

Trusting to hear from you at an early date, I am, my dear sir,

Very respectfully and sincerely yours,
C. H. Davis,
Captain U. S. N.

Prof. Alexander Agassiz, Cambridge, Mass.

The following Publications of the Museum of Comparative Zoölogy are in preparation: —

Reports on the Results of Dredging Operations in 1877, 1878, 1879, and 1880, in charge of Alexander Agassiz, by the U. S. Coast Survey Steamer "Blake," as follows: —

E. EHLERS. The Annelids of the "Blake."
C. HARTLAUB. The Comatulæ of the "Blake," with 15 Plates.
H. LUDWIG. The Genus Pentacrinus.
A. MILNE EDWARDS and E. L. BOUVIER. The Crustacea of the "Blake."
A. E. VERRILL. The Alcyonaria of the "Blake."

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., Commanding.

Illustrations of North American MARINE INVERTEBRATES, from Drawings by Burkhardt, Sonrel, and A. Agassiz, prepared under the direction of L. Agassiz.

LOUIS CABOT. Immature State of the Odonata, Part IV.
E. L. MARK. Studies on Lepidosteus, continued.
" On Arachnactis.
R. T. HILL. On the Geology of the Windward Islands.
W. McM. WOODWORTH. On the Bololo or Palolo of Fiji and Samoa.
A. AGASSIZ and A. G. MAYER. The Acalephs of the East Coast of the United States.
AGASSIZ and WHITMAN. Pelagic Fishes. Part II., with 14 Plates.
J. C. BRANNER. The Coral Reefs of Brazil.

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieutenant Commander Z. L. Tanner, U. S. N., Commanding, in charge of Alexander Agassiz, as follows: —

A. AGASSIZ. The Pelagic Fauna.
" The Echini.
" The Panamic Deep-Sea Fauna.
K. BRANDT. The Sagittæ.
" The Thalassicolæ.
C. CHUN. The Siphonophores.
" The Eyes of Deep-Sea Crustacea.
W. H. DALL. The Mollusks.
H. J. HANSEN. The Cirripeds.
W. A. HERDMAN. The Ascidians.
S. J. HICKSON. The Antipathids.
W. E. HOYLE. The Cephalopods.
G. VON KOCH. The Deep-Sea Corals.
C. A. KOFOID. Solenogaster.
R. VON LENDENFELD. The Phosphorescent Organs of Fishes.
H. LUDWIG. The Starfishes.
J. P. McMURRICH. The Actinarians.
E. L. MARK. Branchiocerianthus.
JOHN MURRAY. The Bottom Specimens.
P. SCHIEMENZ. The Pteropods and Heteropods.
THEO. STUDER. The Alcyonarians.
M. P. A. TRAUSTEDT. The Salpidæ and Doliolidæ.
E. P. VAN DUZEE. The Halobatidæ.
H. B. WARD. The Sipunculids.
H. V. WILSON. The Sponges.
W. McM. WOODWORTH. The Nemerteans.
" The Annelids.

PUBLICATIONS

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE.

There have been published of the BULLETIN Vols. I. to XXXVIII., and also Vol. XL.; of the Memoirs, Vols. I. to XXIV., and also Vol. XXVIII.

Vols. XXXIX., XLI., XLII., XLIII., XLIV., XLV., of the BULLETIN, and Vols. XXV., XXVI., XXVII., XXIX., XXX., and XXXI. of the MEMOIRS, are now in course of publication.

The BULLETIN and MEMOIRS are devoted to the publication of original work by the Professors and Assistants of the Museum, of investigations carried on by students and others in the different Laboratories of Natural History, and of work by specialists based upon the Museum Collections and Explorations.

The following publications are in preparation:—

Reports on the Results of Dredging Operations from 1877 to 1880, in charge of Alexander Agassiz, by the U. S. Coast Survey Steamer "Blake," Lieut. Commander C. D. Sigsbee, U. S. N., and Commander J. R. Bartlett, U. S. N., Commanding.

Reports on the Results of the Expedition of 1891 of the U. S. Fish Commission Steamer "Albatross," Lieut. Commander Z. L. Tanner, U. S. N., Commanding, in charge of Alexander Agassiz.

Reports on the Scientific Results of the Expedition to the Tropical Pacific, in charge of Alexander Agassiz, on the U. S. Fish Commission Steamer "Albatross," from August, 1899, to March, 1900, Commander Jefferson F. Moser, U. S. N., Commanding.

Contributions from the Zoölogical Laboratory, Professor E. L. Mark, Director.

Contributions from the Geological Laboratory, in charge of Professor N. S. Shaler.

These publications are issued in numbers at irregular intervals; one volume of the Bulletin (8vo) and half a volume of the Memoirs (4to) usually appear annually. Each number of the Bulletin and of the Memoirs is sold separately. A price list of the publications of the Museum will be sent on application to the Librarian of the Museum of Comparative Zoölogy, Cambridge, Mass.